

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD
IRRIGATION SYSTEM, TAILWATER RECOVERY
(No.)
CODE 447**

DEFINITION

A planned irrigation system in which all facilities utilized for the collection, storage, and transportation of irrigation tailwater for reuse have been installed.

PURPOSE

This practice may be applied as part of a conservation management system to support one or more of the following:

- Conserve irrigation water supplies
- Improve offsite water quality

CONDITIONS WHERE PRACTICE APPLIES

Tailwater recovery systems are suitable for use on lands served by a properly designed and installed irrigation system, when anticipating recoverable irrigation runoff flows.

This standard applies to the planning and design of irrigation tailwater-recovery systems including, but not limited to, collection ditches, culverts, grade stabilization structures, pipelines, pits, sediment basins, sumps, and water control structures. It does not apply to detailed design criteria or construction specifications for individual structures or components of the recovery system.

CRITERIA

The installation and operation of a tailwater recovery system shall comply with all federal, state, and local laws, rules, and regulations.

Design irrigation systems to limit tailwater volumes to that needed for efficient irrigation and effective operation.

Design and construct facilities for a tailwater recovery system according to appropriate NRCS standards and specifications. The design of components not addressed in a NRCS practice standard shall be consistent with sound engineering principles.

Irrigation tailwater-recovery facilities can be an integral part of irrigation systems covered by

NRCS Conservation Practice Standards 442, Sprinkler, and 443, Surface and Subsurface.

Storage facilities. In determining the size of the storage facility, consider runoff volume and rate, as well as the required level of water control at the point where the tailwater returns to the irrigation system,

When discharging tailwater into an irrigation pit or regulating reservoir or into a pipeline having facilities for regulating fluctuating flows (i.e. a float valve), small sumps with frequently cycling pumping plants are acceptable.

In systems where flow is unregulated, tailwater sumps or pits shall be large enough to provide the regulation needed to permit efficient use of the water.

When energy sources for tailwater pump-back systems are subject to interruption and no emergency bypass area exists, the tailwater storage shall be able to hold at least the runoff from a single irrigation set.

Install sumps and pits with inlets designed to protect the side slopes and the collection facilities from erosion.

Install sediment traps as needed.

Conveyance facilities. All tailwater recovery systems require means to convey water from the storage facility to a point of entry back into the irrigation system. This may consist of a pumping plant and pipeline to return the water to the upper end of the field, or a gravity outlet with a ditch or pipeline to convey the water to a lower elevation in the irrigation system. Include other components as necessary on a site-specific basis.

Determine the capacity of conveyance facilities by an analysis of the expected runoff rate, the irrigation pit or regulating reservoir storage capacity, and the irrigation application rate. If using the return flow solely as an independent water supply, the volume and rate of flow must be adequate for the irrigation method used.

Criteria to Improve Water Quality

Plan nutrient and pest management measures to minimize chemicals in the tailwater.

When additional storage is required to provide retention time for the breakdown of chemicals in the runoff water, size the storage facility accordingly. Retention times shall be specific to the particular chemical used.

Control seepage to the extent practical with compacted soil liners, commercial liners, soil additives, or other approved methods.

Protect system components from storm events and excessive sedimentation. Design facilities to accommodate sediment deposition with time of retention specific to the particular soil type.

CONSIDERATIONS

Consider the location of the facility to optimize pipe length, pump location, facility accessibility and management, and accommodation of other field operations.

PLANS AND SPECIFICATIONS

Tailwater Recovery Irrigation System plans and specifications shall be prepared for each field site in accordance with this standard and shall describe the requirements for applying the practice to achieve its intended purpose.

OPERATION AND MAINTENANCE

Prepare an Operation and Maintenance plan specific to the facilities installed for use by the landowner or operator responsible. The plan shall provide instructions for operating and maintaining facilities to ensure they work properly to include as a minimum:

- Estimated operating time and flow rate,
- Periodic cleaning and re-grading of collection facilities to maintain proper flow lines and function,
- Periodic checks and removal of debris as necessary to assure proper operation,
- Periodic removal of sediment to maintain design capacity and efficiency,
- Inspection or testing of all pipeline and pumping plant components and appurtenances, as applicable, and

- Routine maintenance of all mechanical components, in accordance with the manufacturer's recommendations.